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**TRANSMITTAL LETTER FOR A PCT INTERNATIONAL APPLICATION**  
**ENTERING THE NATIONAL STAGE IN THE U.S. AS A DESIGNATED or**  
**ELECTED OFFICE UNDER 35 USC 371**

Attorney's Docket No.: KKF1P005

Date: April 29, 1999

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Box PCT Application  
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Washington, D.C. 20231

Transmitted herewith are the papers required to enter the national state in the U.S. as a designated office/elected office for the following PCT international patent application:

**INTERNATIONAL APPLICATION NUMBER: PCT/EP97/05961**

**Int'l Filing Date: 29 October 1997**

**1st Priority Date: 29 October 1996**

**Inventor(s): Christoph HEILAND**

**For: CLAMPING DEVICE AND PRODUCTION PROCESS**

The United States Patent Office is: (select one)

☐ A Designated Office (No Demand was filed - See 37 CFR 1.494)

☒ An Elected Office (A Demand for Preliminary Examination was Filed - See 37 CFR 1.495)

Enclosed are:

- ☒ A copy of the face page only of the international application (if this line is not checked, the international application was previously communicated by the International Bureau or the international application was originally filed in the USPTO).
- ☒ An English Translation of the International Application - including **4** sheets of drawings
- ☒ A Combined Declaration and Power of Attorney
- ☐ A copy of amendments made under PCT Article 19
- ☐ A translation of amendments made under PCT Article 19
- ☒ A copy of amendment made under PCT Article 34
- ☒ A translation of amendments made under PCT Article 34
- ☐ A translation of annexes to the international preliminary examination report
- ☒ Verified Statement establishing Small Entity Status under 37 CFR 1.9 and 1.27.
- ☐ An Assignment of the Invention to:  
(with \$40.00 recordal fee)
- ☐ Information Disclosure Statement
- ☒ A Preliminary Amendment
- ☒ A copy of the International Search Report
- ☐ A copy of the Preliminary Examination Report

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### FEE CALCULATION

X The Commissioner is hereby authorized to charge any additional fees or credit any overpayment to Deposit Account No. 50-0384. A duplicate copy of this transmittal is enclosed.

Please direct all correspondence concerning this case to the undersigned at HICKMAN STEPHENS & COLEMAN, LLP, P.O. Box 52037, Palo Alto, CA 94303-0746.

Respectfully submitted,

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Applicant/Patentee: HEILAND Christoph  
Serial or Patent No. \_\_\_\_\_ Atty Docket No. KKF1P005  
Filed or Issued: \_\_\_\_\_  
For: CLAMPING DEVICE AND PRODUCTION PROCESS

**VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY STATUS**  
**37 CFR 1.9(f) and 1.27(b)--INDEPENDENT INVENTOR**

As a below-named inventor, I hereby declare that I qualify as an independent inventor as defined in 37 CFR 1.9(c) for purposes of paying reduced fees under section 41(a) and (b) of Title 35, United States Code, to the Patent and Trademark Office with regard to the invention entitled: \*\*\* described in

☒ the specification filed herewith  
☐ application serial no. \_\_\_\_\_, filed \_\_\_\_\_  
☐ patent no. \_\_\_\_\_, issued \_\_\_\_\_

I have not assigned, granted, conveyed or licensed and am under no obligation under contract or law to assign, grant, convey or license, any rights in the invention to any person who could not be classified as an independent inventor under 37 CFR 1.9(c) if that person had made the invention, or to any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).


Each person, concern or organization to which I have assigned, granted, conveyed, or licensed or am under an obligation under contract or law to assign, grant, convey, or license any rights in the invention is listed below:

☒ no such person, concern, or organization  
☐ person, concerns or organizations listed below\*

\*NOTE: Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27)

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b)).

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 1001 of Title 18 of the U.S. Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

<u>HEILAND Christoph</u>		
NAME OF INVENTOR	NAME OF INVENTOR	NAME OF INVENTOR
		
Signature of Inventor	Signature of Inventor	Signature of Inventor
Date <u>April 27, 1999</u>	Date _____	Date _____

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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the application of	)	
HEILAND, Christoph	)	Examiner: Unassigned
Application No.: Unassigned	)	Art Unit: Unassigned
Filed: April 26, 1999	)	
For: CLAMPING DEVICE AND PRODUCTION	)	Date: April 29, 1999
<u>PROCESS</u>	)	

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents  
Washington, D.C. 20231

Greetings:

By way of a Preliminary Amendment, please enter the following amendments before initial prosecution of the above-identified patent application.

In the Claims:

Please amend claims 3, 4, 6, 8, 12 and 13 as follows.

3. (Amended) A [C]lamping device as [claimed]recited in [any one of C]claim[s] 1 [and 2], [characterised in that in]wherein the hollow chamber profits [(P)] of the pincer portions [(6, 10) and/or] of the grip jaws [(4, 15)] are formed integrally with the boundary walls of the hollow chamber profiles including at least one web [(18')] running transversely to [their]the grip jaws direction of actuation[are formed integrally with the boundary walls fo the hollow chamber profiles (P)].
4. (Amended) A [C]lamping device as [claimed]recited in [any one of C]claim[s] 1 [to 3], [characterised in that in]wherein a spring device [(9, 12)] forces the pincer portions [(10)] apart in addition to the biasing force.

6. (Amended) A[C]lamping device as [claimed]recited in [C]claim 1[ or 2],  
[characterised in that ]wherein the pincer portions [(18) ]are connected with a  
spreader device [(20, 19, 21) which has, via]comprising attenuated portions, web  
[(19) ]connected with the ends of the pincer portions [(18)], [the two webs (19)]  
having an overall length which is [somewhat] greater than the distance between the  
free ends of the pincer elements [(18)] when the grip jaws [(15)] are [lying ] adjacent  
to each other.
8. (Amended) Ac[C]lamping device as recited[claimed in any one of C]in claim[s] 1  
[to 7], [characterised in that ]wherein the clamping devices [(3) or their half-profiles  
(3')] are [made by a]manufactured utilizing a plastic extrusion process, [especially  
with]comprising co-extruded gripping, clamping and/or connecting points [(23,  
23')].
12. (Amended) A [P]process as [claimed in any of C]recited in claim[s] 9 [to 11],  
[characterised in that]wherein predetermined breaking points are stamped into the  
length of extruded plastic.
13. (Amended) A[P]process as [claimed in any of C]recited in claim[s] 9[ to 12],  
[characterised in that]wherein the latching profiles, which fit into each other, are  
extruded to form a snap connection [(30) ]between the half-profiles [(3')] ]in the  
transition area [(5)].

Please Add the following new claims 14-31

14. (NEW) A clamping device as recited in claim 2, wherein the hollow chamber profits of the pincer portions of the grip jaws are formed integrally with the boundary walls of the hollow chamber profiles including at least one web running transversely to the grip jaws direction of actuation.
15. (NEW) A clamping device as recited in claim 2, wherein a spring device forces the pincer portions apart in addition to the biasing force.
16. (NEW) A clamping device as recited in claim 3, wherein a spring device forces the pincer portions apart in addition to the biasing force.
17. (NEW) A clamping device as recited in claim 14, wherein a spring device forces the pincer portions apart in addition to the biasing force.
18. (NEW) A clamping device as recited in claim 2, wherein the pincer portions are connected with a spreader device comprising attenuated portions, web connected with the ends of the pincer portions, having an overall length which is greater than the distance between the free ends of the pincer elements when the grip jaws are adjacent to each other.
19. (NEW) A clamping device as recited in claim 2, wherein the clamping devices are manufactured utilizing a plastic extrusion process, comprising co-extruded gripping, clamping and/or connecting points.
20. (NEW) A clamping device as recited in claim 3, wherein the clamping devices are manufactured utilizing a plastic extrusion process, comprising co-extruded gripping, clamping and/or connecting points.
21. (NEW) A clamping device as recited in claim 3, wherein the clamping devices are manufactured utilizing a plastic extrusion process, comprising co-extruded gripping, clamping and/or connecting points.

22. (NEW) A clamping device as recited in claim 4, wherein the clamping devices are manufactured utilizing a plastic extrusion process, comprising co-extruded gripping, clamping and/or connecting points.
23. (NEW) A clamping device as recited in claim 5, wherein the clamping devices are manufactured utilizing a plastic extrusion process, comprising co-extruded gripping, clamping and/or connecting points.
24. (NEW) A clamping device as recited in claim 6, wherein the clamping devices are manufactured utilizing a plastic extrusion process, comprising co-extruded gripping, clamping and/or connecting points.
25. (NEW) A clamping device as recited in claim 7, wherein the clamping devices are manufactured utilizing a plastic extrusion process, comprising co-extruded gripping, clamping and/or connecting points.
26. (NEW) A clamping device as recited in claim 14, wherein the clamping devices are manufactured utilizing a plastic extrusion process, comprising co-extruded gripping, clamping and/or connecting points.
27. (NEW) A clamping device as recited in claim 15, wherein the clamping devices are manufactured utilizing a plastic extrusion process, comprising co-extruded gripping, clamping and/or connecting points.
28. (NEW) A clamping device as recited in claim 16, wherein the clamping devices are manufactured utilizing a plastic extrusion process, comprising co-extruded gripping, clamping and/or connecting points.
28. (NEW) A clamping device as recited in claim 17, wherein the clamping devices are manufactured utilizing a plastic extrusion process, comprising co-extruded gripping, clamping and/or connecting points.

29. (NEW) A process as recited in claim 10, wherein predetermined breaking points are stamped into the length of extruded plastic.
30. (NEW) A process as recited in claim 11, wherein predetermined breaking points are stamped into the length of extruded plastic.
31. (NEW) A process as recited in claim 12, wherein the latching profiles, which fit into each other, are extruded to form a snap connection between the half-profiles in the transition area.

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**Description:****Clamping device and process for the production thereof**

The invention relates to a clamping device having two grip jaws, both merging into a pincer portion and being linked to each other in the transition area by a crosspiece. This clamping device may take the form of a clamp where, in the non-actuated state, the grip jaws lie preferably adjacent to each other in a biased state, whilst the pincer portions are spread apart, or of a grip in which the grip jaws, in the non-actuated state, are opened and spaced apart. The invention also relates to a process for manufacturing such clamping devices.

It is the object of the present invention to provide a clamping device of the kind described which can be manufactured at low costs.

In accordance with the invention, this object is achieved by means of the features presented in Claims 1 and 10. Advantageous embodiments of the invention are characterised in the dependent claims.

According to the present invention, the clamping device or its half-profiles are integrally made of plastic - for example PVC, POM, PC or PP, the pincer portions taking the form of hollow chamber profiles. This considerably reduces the amount of material used, a high degree of rigidity being achieved for the pincer portions and/or the grip jaws in spite of thin walls. Accordingly, it is further suggested that the grip jaws also take the form of hollow compartments.

If the grip jaws of the clamping device in their non-activated state are adjacent to each other and the pincer portions at the same time spaced apart, preferably spread apart at an angle, the clamping device is a clamp the jaws of which are opened against the force of a spring by pressing the pincer portions onto each other. In this process, the connecting faces of the grip jaws on

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both sides, along with their pincer portions adjacent thereto (which, preferably, are configured in a plane symmetrical to the longitudinal axis of the clamping device), are linked together with a crosspiece so formed and dimensioned that the elastic properties of this latter displace the opened grip jaws again into the closed state, when the pincer portions are released.

Provision may, however, also be made, for the pincer portions to be forced apart by a spring device, for which purpose, for example, a spring-loaded metal or plastic clasp may be positioned between the pincer portions. Provision may, however, also advantageously be made whereby the spring device is formed by extensions which are formed at the ends of the pincer portions, are bent round inwards and which run at an angle towards each other and, preferably, whose free ends are adjacent to each other. They may, however, also be connected to each other at the ends.

The extensions which are bent over and inwards preferably enclose an angle of 60 to 90° and, when the grip jaws open, are pressed against each other in such a way that they finally lie mutually adjacent along their straight ends, this elastic deformation bringing about a considerable elastic force which presses the grip jaws powerfully together when the pincer portions are released.

The grip jaws of the clamping device in accordance with the invention can, however, also be opened in their non-actuated state, preferably spread apart, so that, together with pincer portions which are similarly spread apart, they approximate the shape of the letter "X", the length of the legs provided by the grip jaws, however, preferably being shorter than those of the pincer portions. With this embodiment, the clamping device forms a clamp, the jaws of which, by the pressing apart of the pincer portions, can be pressed against each other, in order to form, for example, a tube or a bag in such a condition.

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Provision is also hereby made for the pincer portions to be connected to a spreader device which not only presses apart the pincer portions to close the grip jaws, but can also preferably maintain the grip jaws in their closed condition. A particularly advantageous proposal here is that the spreader device should have two webs connected to the ends of the pincer pieces by means of two attenuated portions or film hinges, said webs being connected to at least one more attenuated portion or film hinge, the two pieces being arranged in alignment in such a manner as to produce an overall length which is somewhat greater than the distance between the free ends of the pincer pieces in the closed state.

With this embodiment of the invention the restoring force of the film hinges is such that, in the pressed-inwards over-centre position, the webs exert on the pincer portions such a spreading force that the grip jaws remain closed and biased. Accordingly, the film hinges prevent the webs from moving in complete freedom in relation to each other and to the pincer portions, instead taking up a position, after being displaced beyond the centre point, in which they press the pincer portions apart. This position may also be defined by stops on the pincer portions and the webs.

It is further proposed that, in the area where the two webs join, a pincer element be positioned which, in each case, is connected with the ends of the webs on both sides via a film hinge or an attenuated portion. Said pincer element projects outwards and may take the form of a hollow body.

The sequence of film hinge, web, film hinge, pincer element, film hinge, web, film hinge goes to form the spreader device and simplifies the opening of the grip by enabling the webs on the pincer element to be drawn beyond the dead centre point into the release position. Obviously, the grip does not necessarily have to be equipped with such a pincer element; instead, the over-dead centre position of the webs can also be released by

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pressing the pincer portions laterally together, if the dimensions of the pincer portions and the webs are chosen accordingly.

In accordance with the invention, it is further proposed to make the clamping devices and their half-profiles using the plastic extrusion process. Though it is also possible to manufacture the clamp individually or in several pieces hanging on to each other using the injection moulding process, the plastic extrusion process is particularly advantageous, since it presents a way of extruding any length of continuous plastic with the (half) profile of the clamping device and from which, after the cooling process, the clamping devices can be cut off into the desired widths or be broken off at the predetermined breaking points and joined to each other if necessary. This means that the clamping devices in accordance with the invention can be made at particularly low costs since a separate tool is not required for the different widths.

Moreover, this method offers the possibility of generating a biasing force after extrusion which enables the grip jaws to lie adjacent to each other. This biasing force may be produced in a calibrating area - e.g. in a bath of water, where the pincer portions which, for example, have already been partially hardened, may be spread or pressed together between rollers.

Accordingly, the invention provides for universal clamps and universal clips which can be manufactured in various widths using one and the same tool, if the particularly preferred extrusion method is used. Different levels of biasing force in the clamps can be produced in a calibration process after extrusion, so that the clamps can securely hold both thin objects (such as a sheet of paper) and relatively thick objects (such as a pile of paper sheets). Moreover, a softer material can be co-extruded at the holding or clamping points, in order to increase the slip-inhibiting properties. The clamp in

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accordance with the invention may also comfortably be operated with one hand.

Several embodiments of the invention will be described in more detail below with reference to the drawings, wherein:

Fig. 1A to 1C

show a perspective view and also a front view of a first embodiment of a clamp in accordance with the invention in the closed and open conditions;

Fig. 2A to 2C

show a perspective view and also a front view of a second embodiment of a clamp in the closed and open conditions;

Fig. 3A to 3C

show a perspective view and also a front view of a third embodiment of a clamp in the closed and open conditions;

Fig. 4A to 4C

show a perspective view and a front view of a grip in accordance with the invention in the closed and open conditions;

Fig. 5

shows a clamp, the two halves of which are manufactured in mirror image by a plastic extrusion process and finally joined together to form an integral component by means of welding;

Fig. 6

shows a modified embodiment wherein a spring device is integrally moulded on or inserted;

Fig. 7A and 7B

show a further modified embodiment of the clamp, wherein in the left-hand half, the preferred co-extrusion process used is illustrated, whilst in the half on the right, a snap-in region of the transition area is shown; and

Fig. 8

shows a further modified embodiment of the clamping device, wherein an identical and extruded basic element is joined to a multi-clamp.

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Fig. 1A shows a first extruded length of clamp section. Lines 1 in the figure indicate that, for example, a multiplicity of clamps may be cut from the extrusion in the width prescribed by the distance between the lines, or broken off at marked predetermined breaking points, with it being possible, however, that the clamp has the entire width shown. For such an eventuality hole 2 is provided, by means of which the clamp may be hung on a hook.

The first embodiment, designated in its entirety with reference numeral 3 and relating to a clamp in accordance with the invention, contains two grip jaws 4, taking the form of thin-walled hollow body profiles and having a shape approximating that of a flat circle segment. In a transition area 5 each of the grip jaws 4, at their upper end section shown in the figure, passes into a pincer portion 6, also having the form of a narrow-walled hollow-chamber section. In the transition area 5, both grip jaws 4 with their integrally moulded pincer portions 6 are connected to each other by a crosspiece 7.

Clamp 3 is formed symmetrically to its longitudinal axis 8, and this applies also to the remaining embodiments of the invention. However, the invention is not limited to this and grip jaws 4 may also, for example, have different profiles on both their internal and external sides. Depending on the intended application, the insides of the grip jaws may be provided with toothed profiles, smooth profiles, round or, for example, serrated recesses and also special additional recesses for specific retaining brackets.

Fig. 1B shows the non-activated state of clamp 3, in which both grip jaws 4 lie in a position adjacent to each other and are held biased by virtue of the elasticity of crosspieces 7. Grip jaws 4 are opened by the action of pincer portions 6 which, diverging at an angle in their initial position, are pressed towards each other. This action elastically deforms crosspiece 7, which produces a corresponding amount of restoring force.

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During a process of calibration, pressure may be applied onto the internal sides of pincer portions 6 - for example through roller pressure, in order to produce a biasing force sufficient for grip jaws 4, in the non-activated state of clamp 3 illustrated in Fig. 1B, to lie in a position adjacent to each other.

The main difference between the clamp shown in Fig. 2A to 2C and the first embodiment lies in the fact that the closing force of the clamp prevailing in the state shown in Fig. 2B is increased by the action of a spring clasp 9, which forces apart pincer portions 10. Spring clasp 9 consists appropriately of metal but may also be a plastic clasp. Naturally, other forms of leaf spring, or a coil spring, may also be used. In the area close to grip jaws 4, pincer portions 10 have a hollow chamber section P and ends 11 which are bent inwards in the form of hooks to act as a retaining support for spring clasp 9.

Fig. 2C shows the compressed state of both pincer portions 10 which opens grip jaws 4 and compresses spring clasp 9, so that it develops a high degree of restoring force.

In the third embodiment of the clamp according to the invention, illustrated by Fig. 3A to 3C, pincer portions 10, which are formed by bent-inwards extensions 12 of pincer portions 10, are integrally connected with a spring device. The free ends of extensions 12 are adjacent to each other (reference numeral 13), which may be achieved by initially continuously extruding extensions 12, i.e. joined together, and then cutting them open in a later step.

However, the scope of the invention allows for the extensions 12 to remain joined together. Selecting a suitable wall thickness for extensions 12 and also for the transition area 14 enables the desired restoring force of this spring device to be set. In the case of the embodiment form illustrated, extensions 12 enclose an angle of approximately 60°, without restricting the invention thereto.

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Fig. 4A to 4C show a grip in which, in contrast to the clamps described above, the grip jaws here designated as 15 and in the non-activated state of the grip according to Fig. 4B, are opened, i.e. spread apart. Grip 16 may be operated with one hand by pressing pincer element 17 inwards from the initial position shown in Figure 4B by spreading the pincer portions 10, the pincer portions 18 in addition being bent outwards with grip jaws 15 lying adjacent to each other, before webs 19, moulded to their ends, snap into the over centre position shown in Figure 4C. In this way, the closed condition of grip jaws 15 is reliably maintained.

Webs 19 are connected to the upper ends of pincer portions 18 by means of film hinges 20 which enable webs 19 to swing from the position depicted in Fig. 4B into the arresting position shown in Figure 4C, without, however, allowing further movement inwards due to their residual wall thickness and hence their rigidity, without which grip jaws 18 would otherwise open. This means that the film hinges are formed by areas of reduced wall thickness, which nevertheless still have a degree of rigidity such that the condition shown in Fig. 4C is maintained.

This could also be achieved by causing, in the angular position of webs 19 illustrated in Figure 4A, the inner faces of the webs to hit, for example, against corresponding inner faces of pincer portions 18, thus excluding any further swivelling movement. The pincer element 17, which has a hollow profile, is also connected on both sides by means of film hinges to webs 19, so that, here also, the necessary freedom of movement is guaranteed.

The closed state of the grip in accordance with Fig. 4C may also be reversed by pulling the pincer element 17 upwards as shown in the figure, or lateral pressure may be applied onto pincer portions 18 with the result that webs 19 are moved upwards as a result of the temporary additional spreading of pincer portions 18.

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With all embodiments of the clamping device in accordance with the invention, grip jaws 4 and/or 15 are so designed that they come into contact with each other with the short clamping face 22. The invention is naturally not limited to this and, indeed, the inner and the outer faces of the grip jaws may have all kinds of appropriate contours. Particular attention is here drawn to the embodiment in accordance with Figure 7A, where the clamping face 22 is produced by co-extrusion with a softer plastic 23. This significantly increases the retaining force of clamping device 3. In order to improve the gripping power of the clamping device a softer face 23' in the top outer region of pincer portions 18 may be co-extruded and equally so in area of connection 5 to form crosspiece 7, or also spring device 9 and/or 12.

In Fig. 5 and 6 a particularly preferred embodiment of extruded plastic clamping device 3 is shown. Here, the two symmetrical half-profiles 3' of clamping device 3 along centre line 8 are made using the extrusion process with hollow-chamber profiles P which follow the direction of extrusion (cf. also Fig. 4A) and then, as is illustrated in each case on the right-hand half, are welded together in transition area 5, preferably immediately after the extrusion process by means of fillet welding, where both half-profile sections 3' are pressed onto each other. An important factor here also is the formation of hollow-chamber profiles P with webs 18' running transversely to the direction of actuation since, in this way, and despite the very thin boundary-forming walls and correspondingly diminished use of materials, a particularly high level of stiffness for the pincer portions and/or the grip jaws is achieved. Moreover, welding both half-profiles 3' of the clamping device can achieve a predefined biasing force.

Fig. 6 shows a modified embodiment to which a spring device 12, similar to that shown in Fig. 3, is integrally moulded. Spring device 12 may comprise two single spring legs or one continuous

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leg arc. However, to increase the biasing force, a separate clasp spring 9 may be used as shown in Fig. 2C.

Fig. 7B shows a further embodiment of the clamping device since both half-profiles 3' of clamping device 3, integrally joined together in the transition area, are here also identical and may be joined together by a snap connection 30, a process in which the walls running in the direction of extrusion are pressed together in the transition area 5 on the one hand in the interior part of snap connection 30, whilst the encompassing part of identical design is forced apart. This applies considerable biasing force on the clamping device 3. Particular attention is drawn to the fact that both half-profiles 3', joined together to form integral clamping device 3 and which, as has already been stated, is preferably produced by a process of extrusion, are in mirror image relative to each other, thus forming a rigid, non-flexing joint which has a rhombic cross-section or, if the cross-section is cylindrical, a ball-headed joint.

Fig. 8 illustrates a variation to clamping device 3, in which once again clamping device 3, equipped with hollow-chamber profiles P to reduce material consumption, can be joined together to form a multiple grip and thus be extended as desired. This means that several bags or stacks of paper can be gripped together. Naturally also, more than three such grip jaws may be provided whereby, in the illustration shown here on the right with three grip jaws, the centre grip jaw can, for example, also be positioned overhead so that, as a result, clamping can take place not only in the lower area shown here, but also in the top area in each case. This means that the pincer portion is used at the same time as a grip jaw. This dual benefit brings about further potential uses, for example, by clamping the upper area to a washing line, whilst in the two lower clamping areas, two socks or similar items of washing can be clipped in pairs but separated from each other.

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It should finally be pointed out that, for the purpose of making the integral plastic half-profiles of clamping device 3, the halves illustrated in Fig. 5 to 8 can also be bonded together by adhesive, especially in a continuous bonding process, even if fillet welding is preferred straight after the extrusion process. All these manufacturing processes thus arrive at a clamping device 3 which uses up a minimal amount of material and, despite thinner walls, guarantees a high level of rigidity and a powerful clamping force. The respective biasing force can easily be varied for the different intended applications, for example, by the strength of the bonding force in the transition area 5 or by the angle of inclination of the connecting point 5' in the transition area 5, as is shown in Fig. 5 in the second position from the left.

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**Amended Claims (Art. 34)**

1. Clamping device with two or more grip jaws, which merge into a pincer portion each and are joined together in the transition area by a crosspiece, the clamping device (3) or its half-profiles (3') being integrally formed from plastic and the pincer portions (6, 10, 18) taking the form of hollow chamber profiles (P), characterised in that, in the inoperative state, the grip jaws (4) lie adjacent to each other in a biased condition generated by extrusion and that the pincer portions (6, 10) are spaced apart.
2. Clamping device as claimed in Claim 1, characterised in that the grip jaws (4, 15) also take the form of hollow chamber profiles (P).
3. Clamping device as claimed in any one of Claims 1 and 2, characterised in that in the hollow chamber profiles (P) of the pincer portions (6, 10) and/or of the grip jaws (4, 15) at least one web (18') running transversely to their direction of actuation, are formed integrally with the boundary walls of the hollow chamber profiles (P).
4. Clamping device as claimed in any one of Claims 1 to 3, characterised in that a spring device (9, 12) forces the pincer portions (10) apart in addition to the biasing force.
5. Clamping device as claimed in Claim 4, characterised in that the spring device (12) is formed by moulding extensions (12) to the ends of the pincer portions (10) wherein the extensions (12) are bent around and inwards and which, with their ends, lie at an angle adjacent to each other.
6. Clamping device as claimed in Claim 1 or 2, characterised in that the pincer portions (18) are connected with a spreader device (20, 19, 21) which has, via attenuated

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portions, webs (19) connected with the ends of the pincer portions (18), the two webs (19) having an overall length which is somewhat greater than the distance between the free ends of the pincer elements (18) when the grip jaws (15) are lying adjacent to each other.

7. Clamping device as claimed in Claim 6, characterised in that a pincer element (17) is connected with the ends of the webs (19) via attenuated portions.
8. Clamping device as claimed in any one of Claims 1 to 7, characterised in that the clamping devices (3) or their half-profiles (3') are made by a plastic extrusion process, especially with co-extruded gripping, clamping and/or connecting points (23, 23').
9. Process for manufacturing clamping devices, characterised in that a length of plastic is extruded with hollow chamber profiles (P) to form a multiplicity of clamping devices (3), after the extrusion a biasing force being generated in a calibration zone which causes the grip jaws (4, 15) of the clamping devices (3) to lie adjacent to each other, and that the clamping devices (3) are severed from the extruded length in the desired widths.
10. Process as claimed in Claim 9, characterised in that the biasing force is generated by spreading apart the pincer portions (6, 10) of the clamping devices.
11. Process as claimed in Claim 9, characterised in that the biasing force is generated by the pressing the half-profiles (3') of the clamping devices (3) towards each other, especially with welding in the transition area (5).
12. Process as claimed in any of Claims 9 to 11, characterised in that predetermined breaking points are stamped into the length of extruded plastic.

-3-

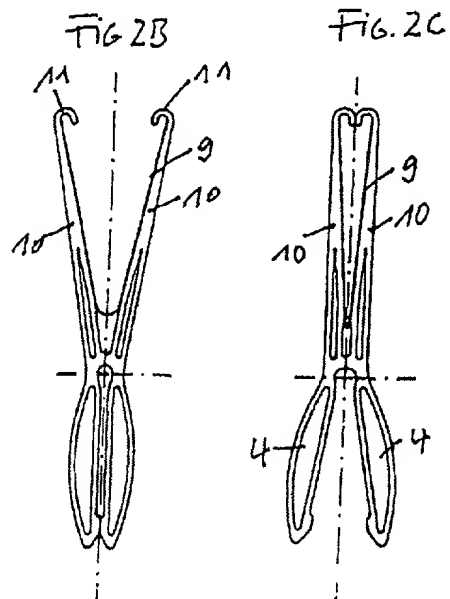
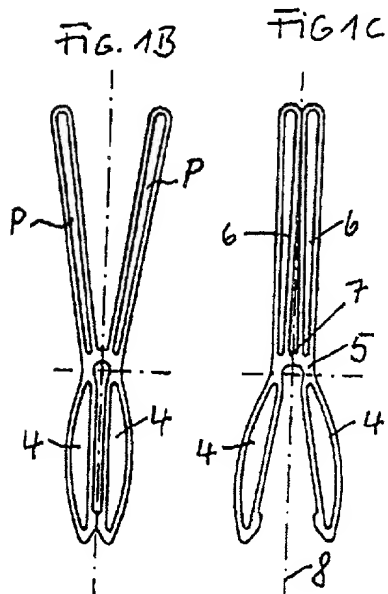
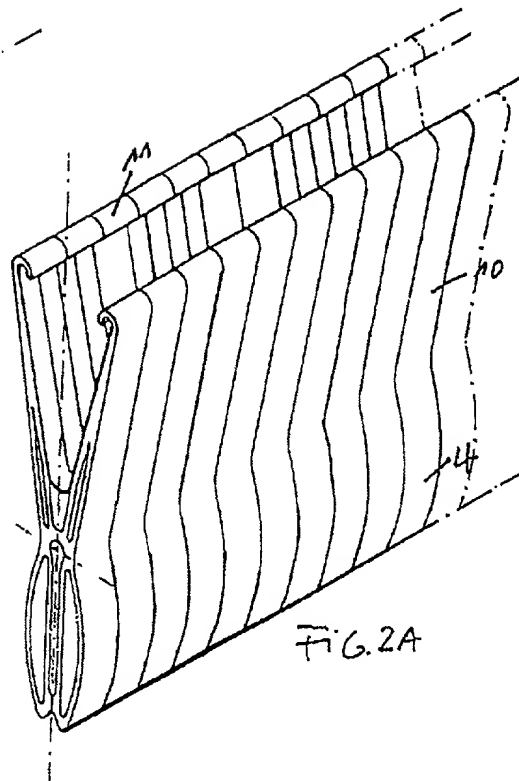
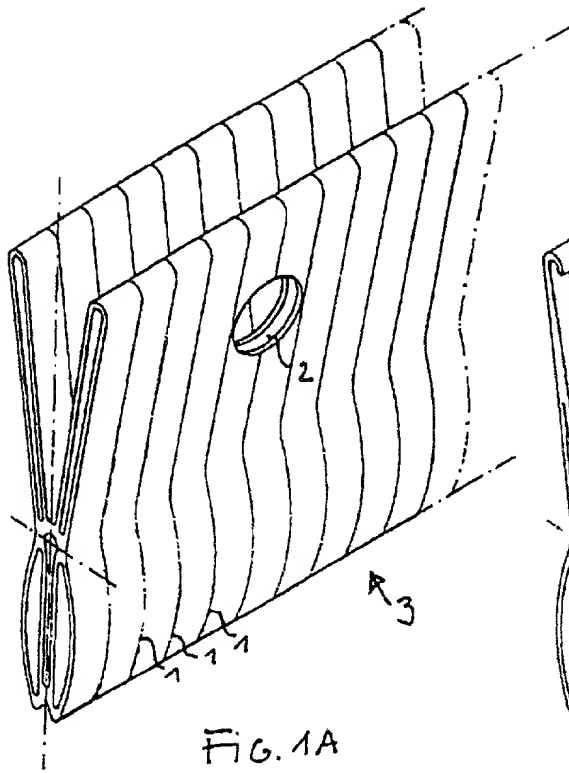
13. Process as claimed in any of Claims 9 to 12, characterised in that latching profiles, which fit into each other, are extruded to form a snap connection (30) between the half-profiles (3') in the transition area (5).

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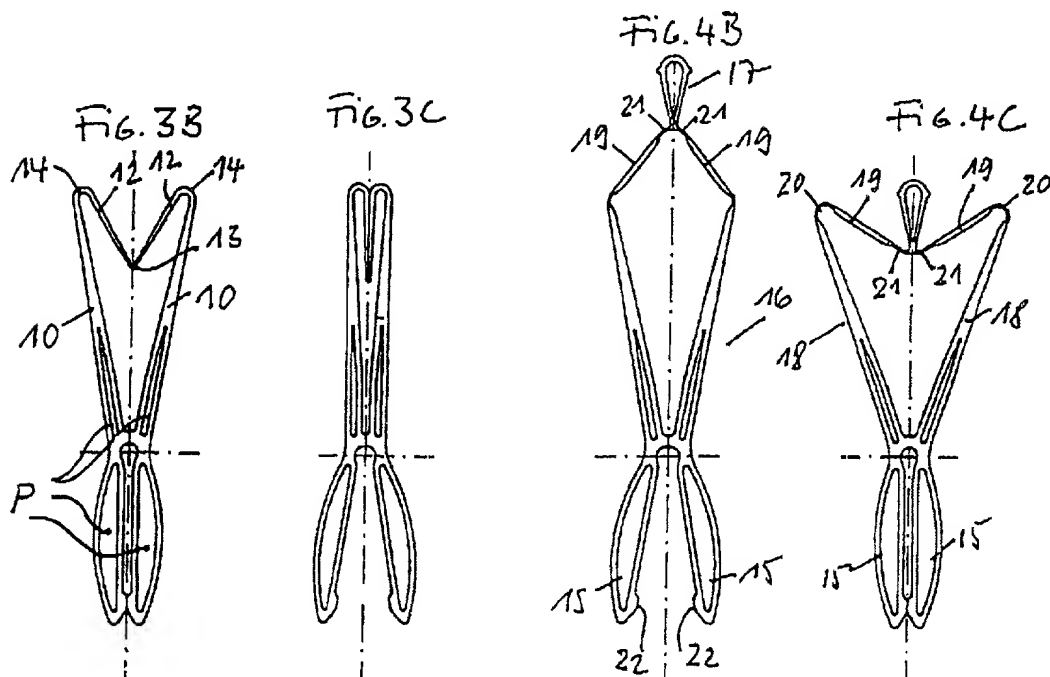
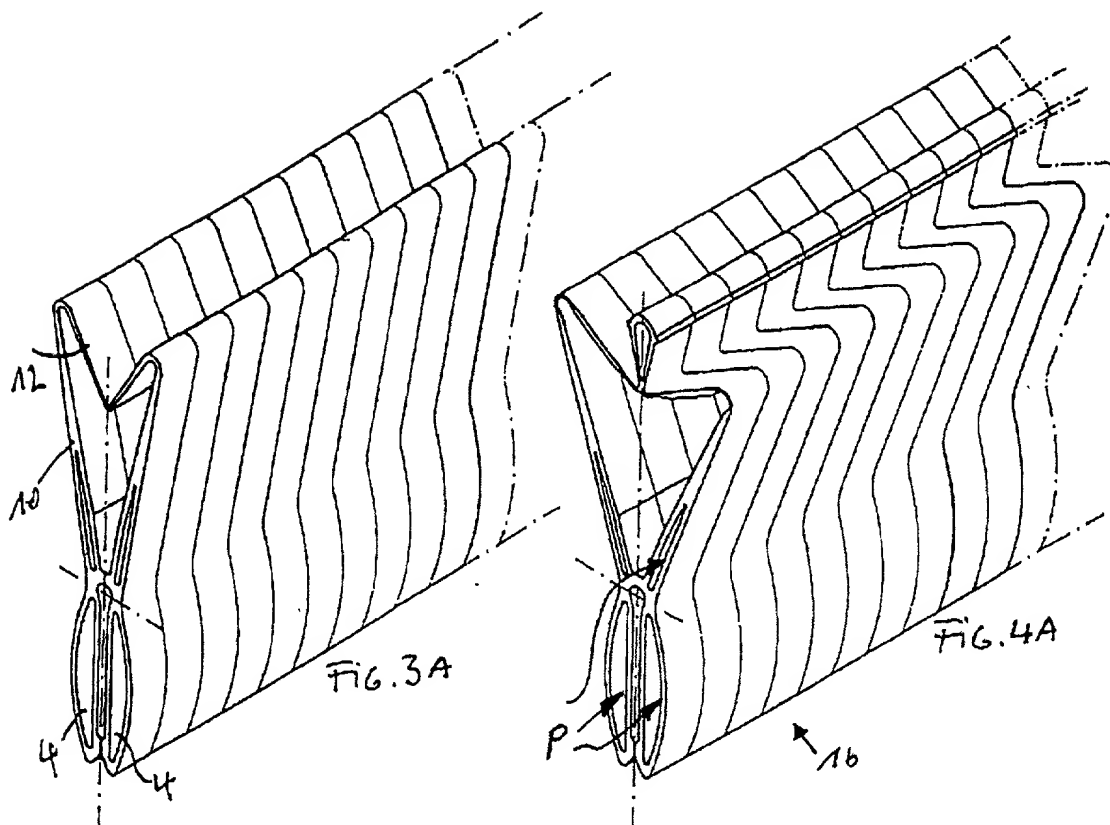


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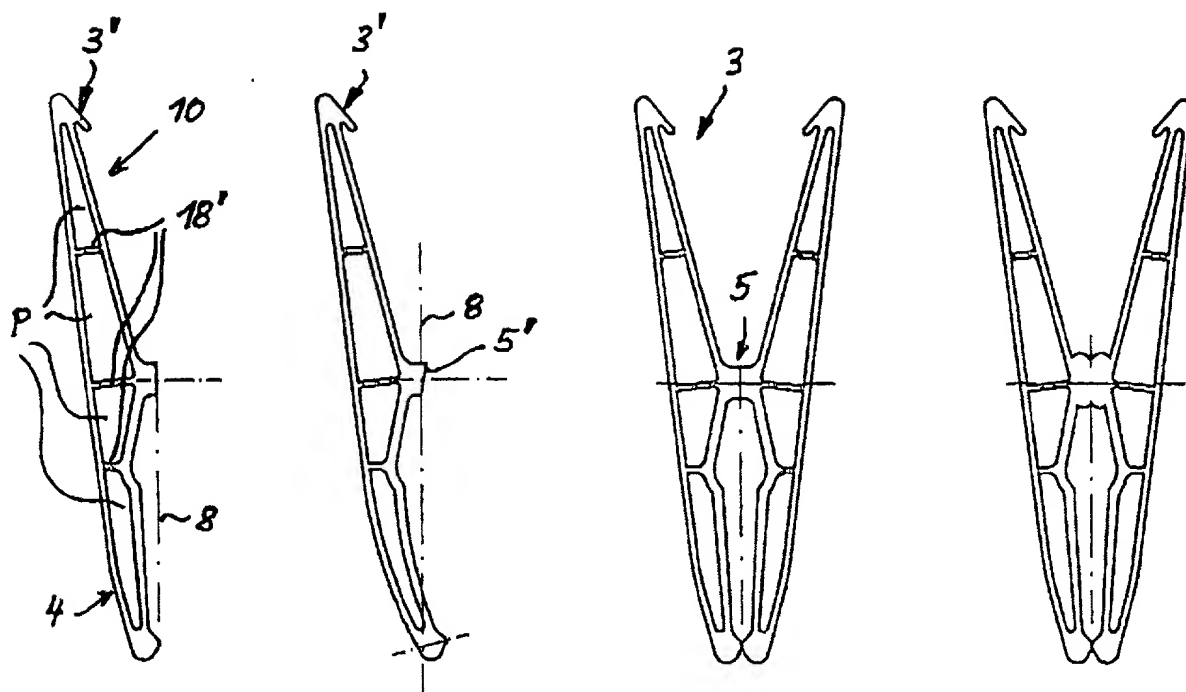


Fig. 5

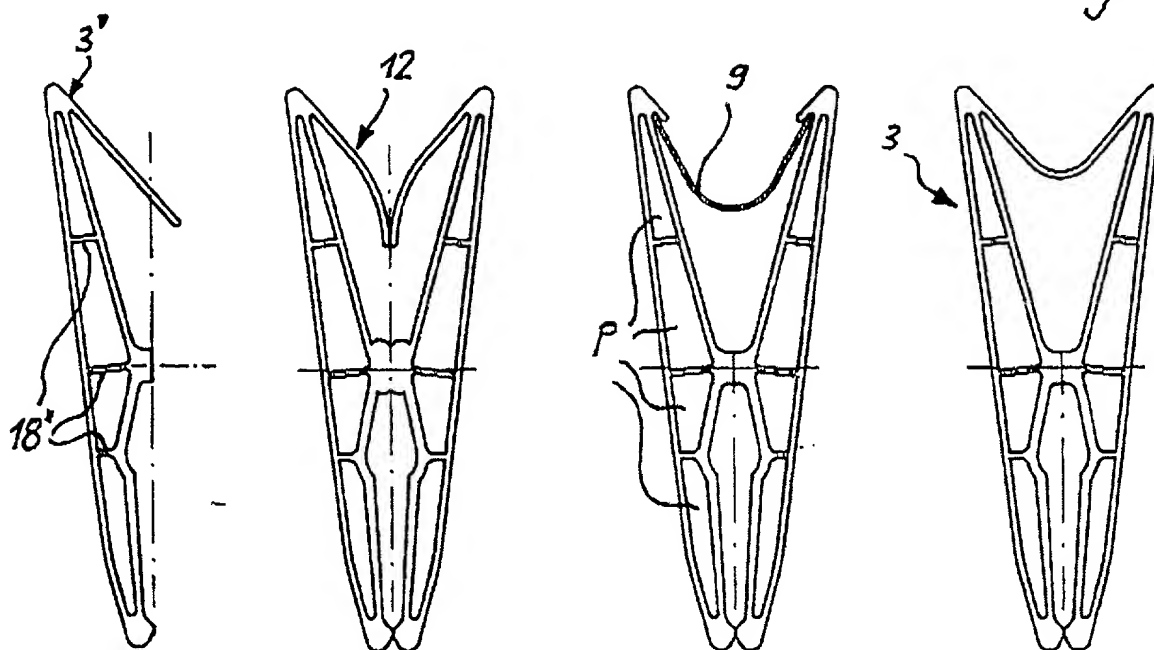


Fig. 6

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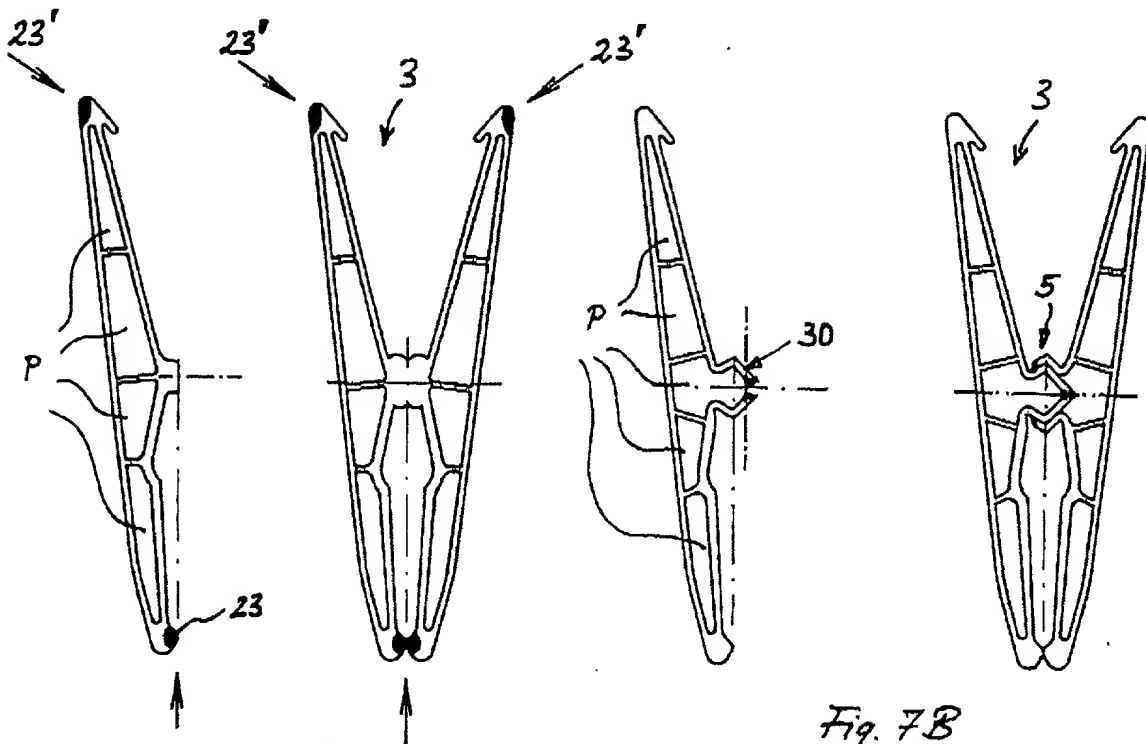


Fig. 7A

Fig. 7B

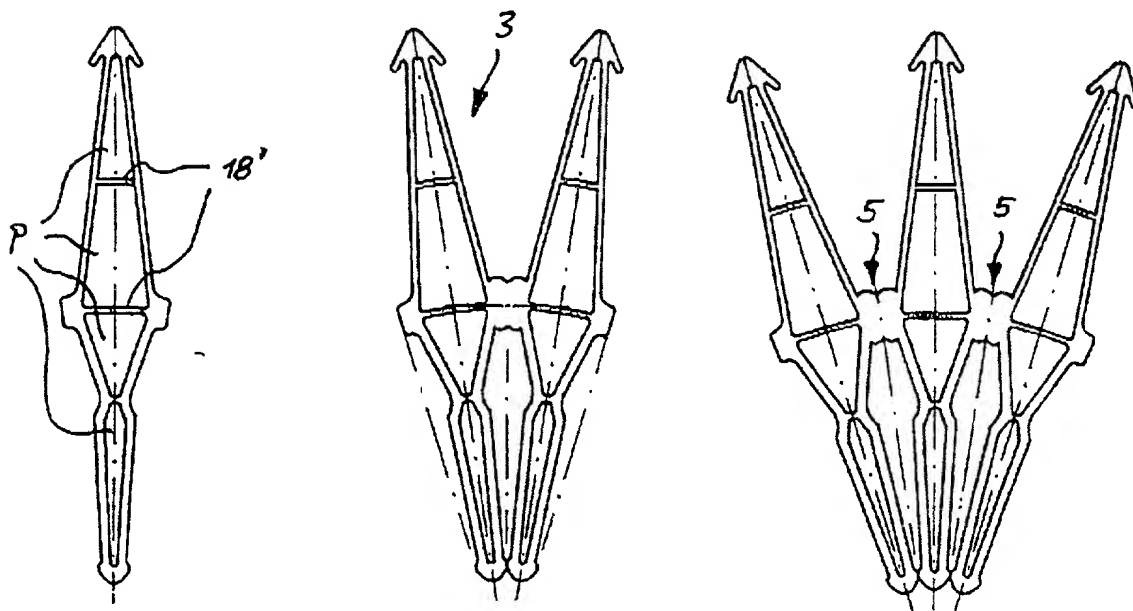


Fig. 8

**DECLARATION AND POWER OF ATTORNEY  
FOR ORIGINAL U.S. PATENT APPLICATION**Attorney's Docket No. KKF1P005

As a below-named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe that I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:  
CLAMPING DEVICE AND PRODUCTION PROCESS the specification of which,

(check one)

1. ☐ is attached hereto.

2. ☐ was filed on \_\_\_\_\_ as  
U.S. Application Serial No. \_\_\_\_\_  
and was amended on \_\_\_\_\_

3. ☒ was filed on October 29, 1997 as  
International PCT Application Serial No. PCT/EP97/05961  
and was amended on November 6, 1998

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, CFR § 1.56.

I hereby claim foreign priority benefits under Title 35, United States code, § 119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed:

**Prior Foreign Application(s)**196 44 822 .0  
(Appl. No.)Germany  
(Country)October 29, 1996  
(Filing Date)**Priority Benefits Claimed?**☒ Yes ☐ No

(Appl. No.) \_\_\_\_\_

(Country) \_\_\_\_\_

(Filing Date) \_\_\_\_\_

☐ Yes ☐ No

(Appl. No.) \_\_\_\_\_

(Country) \_\_\_\_\_

(Filing Date) \_\_\_\_\_

☐ Yes ☐ No

I hereby claim the benefit under 35 U.S.C. § 119(c) of any United States provisional application(s) listed below:

(Application Serial No.) \_\_\_\_\_

(Filing Date) \_\_\_\_\_

(Application Serial No.) \_\_\_\_\_

(Filing Date) \_\_\_\_\_

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s), or § 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application:

(Application Serial No.)

(Filing Date)

(Status - patented, pending, abandoned)

(Application Serial No.)

(Filing Date)

(Status - patented, pending, abandoned)

8 And I hereby appoint the law firm of Hickman Stephens & Coleman, including Paul L. Hickman (Reg. No. 28,516); L. Keith Stephens (Reg. No. 32,632); Brian R. Coleman (Reg. No. 39,145); Michael E. Melton (Reg. No. 32,276); Jerray Wei (Reg. No. 43,247); Robert D. Hayden (Reg. No. 42,645); Kevin J. Zalka (Reg. No. 41,329); and Dominic M. Kotab (Reg. No. 42,762) as my principal attorneys to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

Send Correspondence To:

**HICKMAN STEPHENS & COLEMAN, LLP**  
**P.O. BOX 52037**  
**Palo Alto, California 94303-0746**

Direct Telephone Calls To:

Attny Name at telephone number (650) 470-7430

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

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 Typewritten Full Name of  
 Sole or First Inventor:

HEILAND ChristophCitizenship: German

Inventor's signature

X. HeilandDate of Signature: April 27, 1999Residence: (City) Wurmansau/Saulgrub(State/Country) Germany DEUPost Office Address: Am Wieseneck 12, 82442 Wurmansau/Saulgrub, GermanyFull Name of Second Joint  
Inventor (if any):

Citizenship: \_\_\_\_\_

Inventor's signature

Date of Signature: \_\_\_\_\_

Residence: (City) \_\_\_\_\_

(State/Country) \_\_\_\_\_

Post Office Address: \_\_\_\_\_

Full Name of Third Joint  
Inventor (if any):

Citizenship: \_\_\_\_\_

Inventor's signature

Date of Signature: \_\_\_\_\_

Residence: (City) \_\_\_\_\_

(State/Country) \_\_\_\_\_

Post Office Address: \_\_\_\_\_